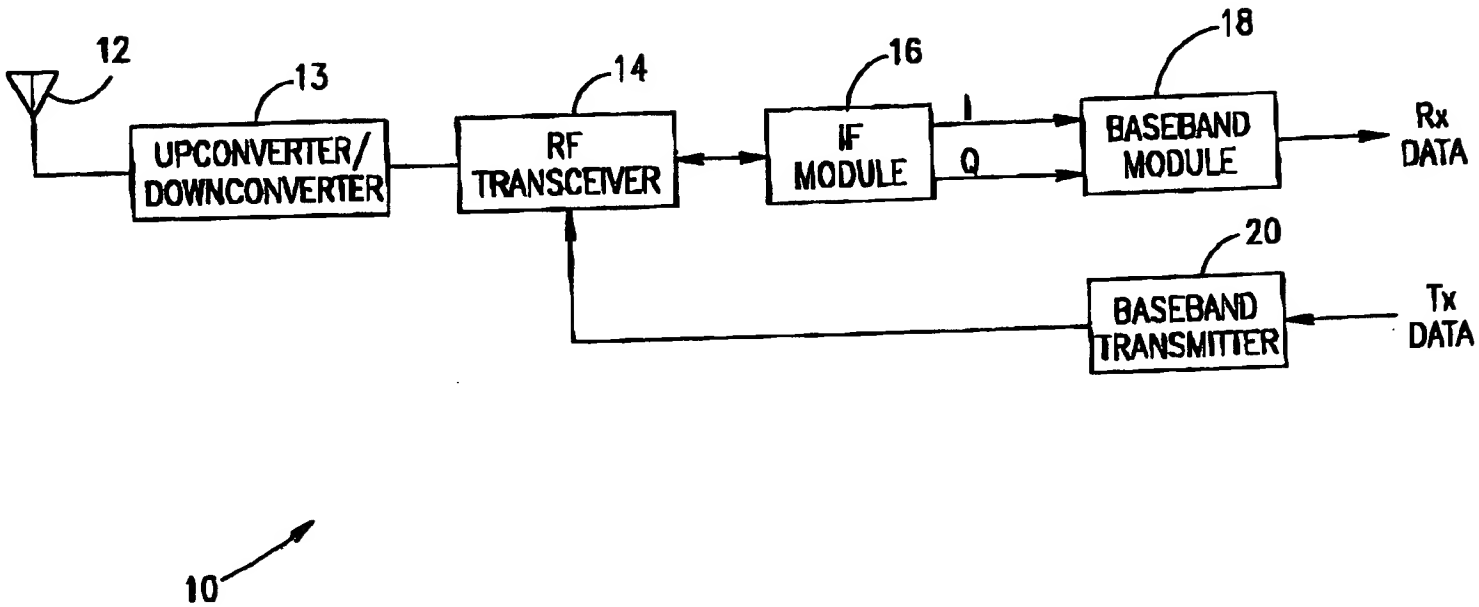

FIG.1

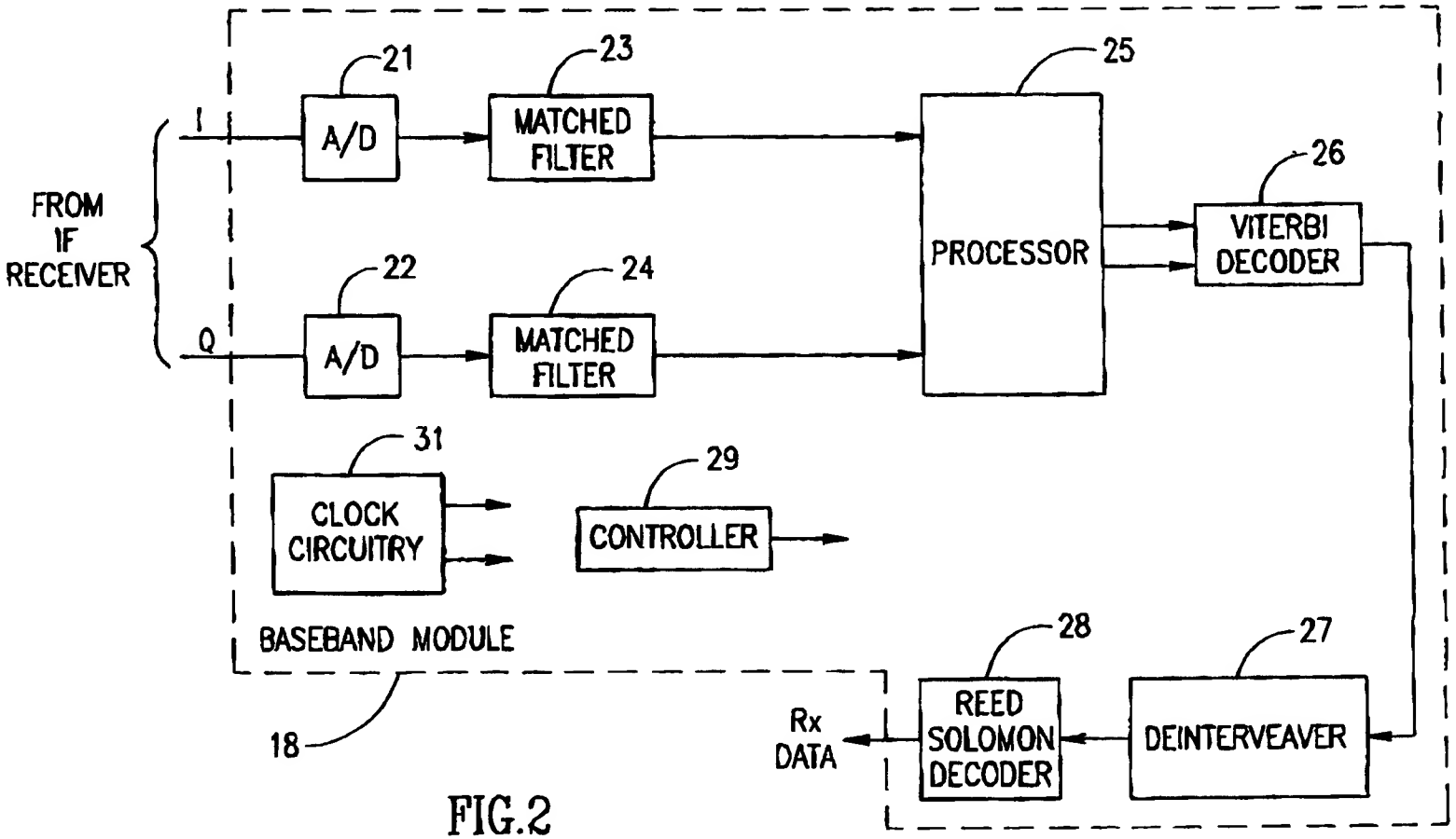

FIG.2

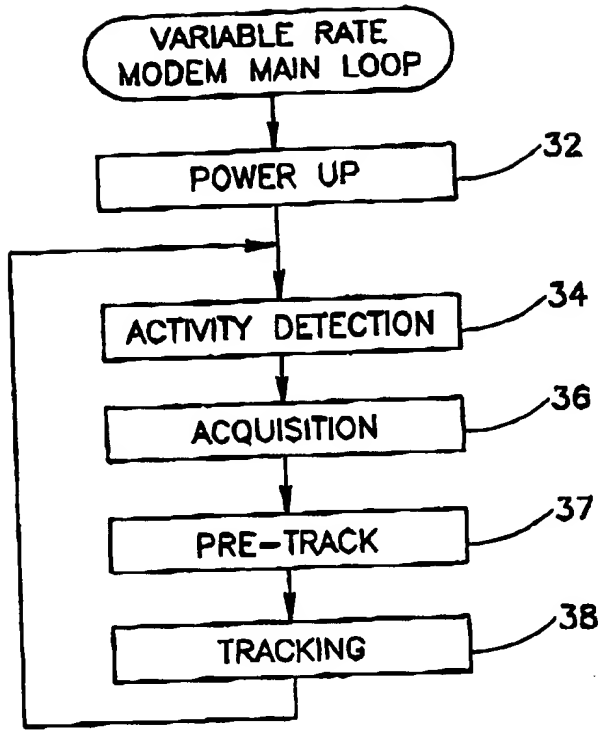
VARIABLE RATE MODEM MAIN LOOP
POWER UP
32
ACTIVITY DETECTION
34
ACQUISITION
36
PRE-TRACK
37
TRACKING
38

FIG.3

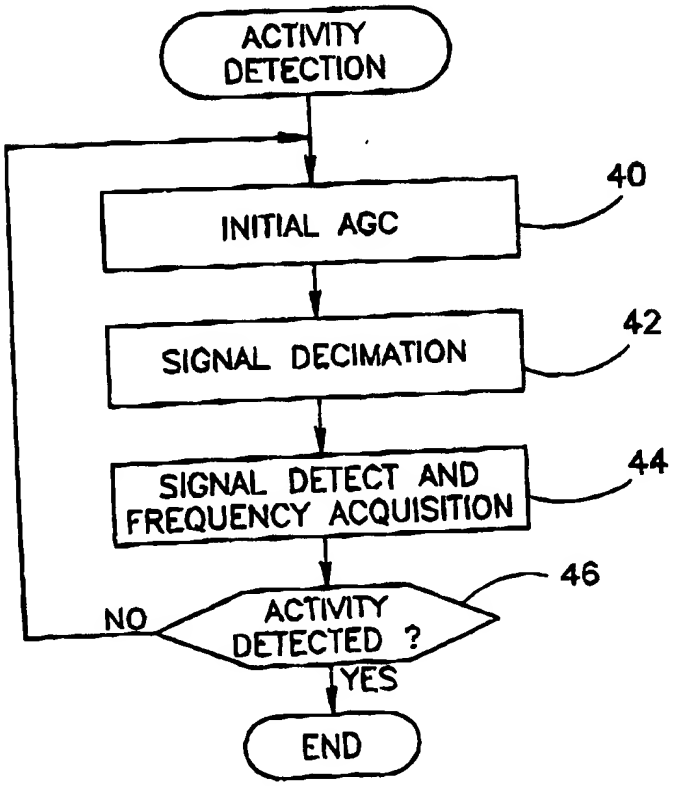
ACTIVITY DETECTION
INITIAL AGC
40
SIGNAL DECIMATION
42
SIGNAL DETECT AND FREQUENCY ACQUISITION
44
ACTIVITY DETECTED ?
46
NO
YES
END

FIG.4

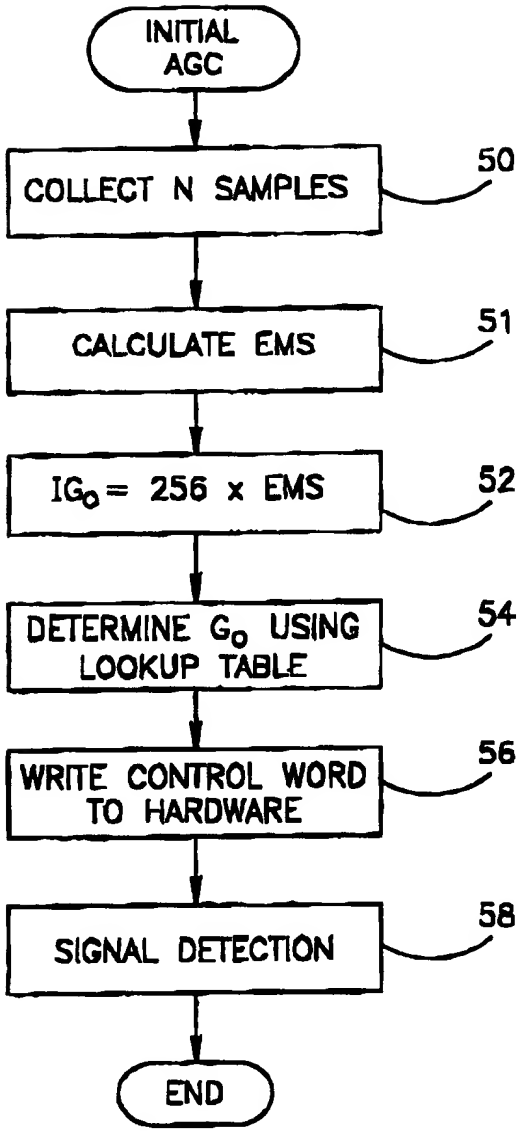
INITIAL AGC
COLLECT N SAMPLES
50
CALCULATE EMS
51
$IG_0 = 256 \times EMS$
52
DETERMINE G_0 USING LOOKUP TABLE
54
WRITE CONTROL WORD TO HARDWARE
56
SIGNAL DETECTION
58
END

FIG.5

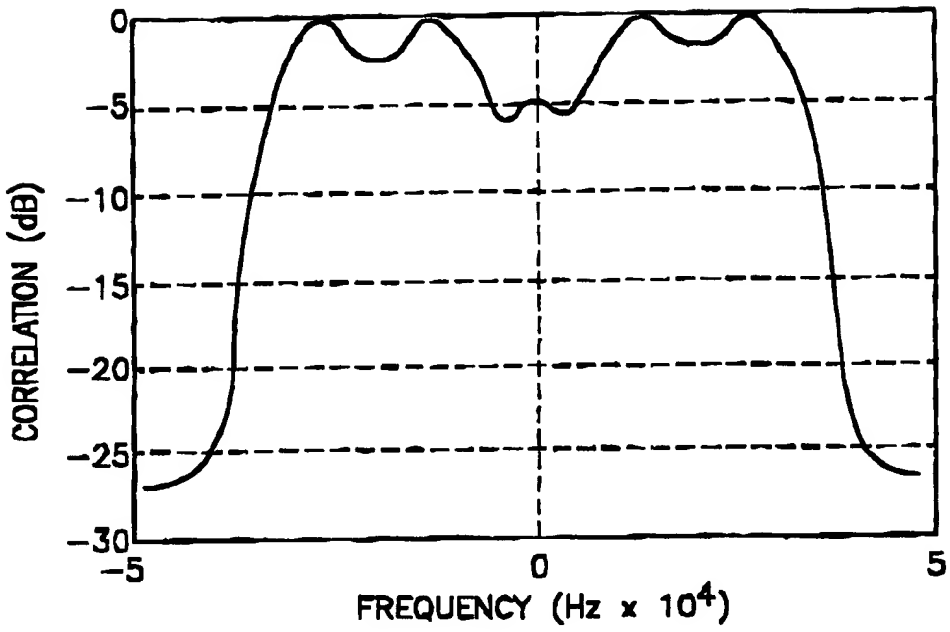
0
-5
-10
-15
-20
-25
-30
CORRELATION (dB)
-5
0
5
FREQUENCY (Hz x 10^4)

FIG.6

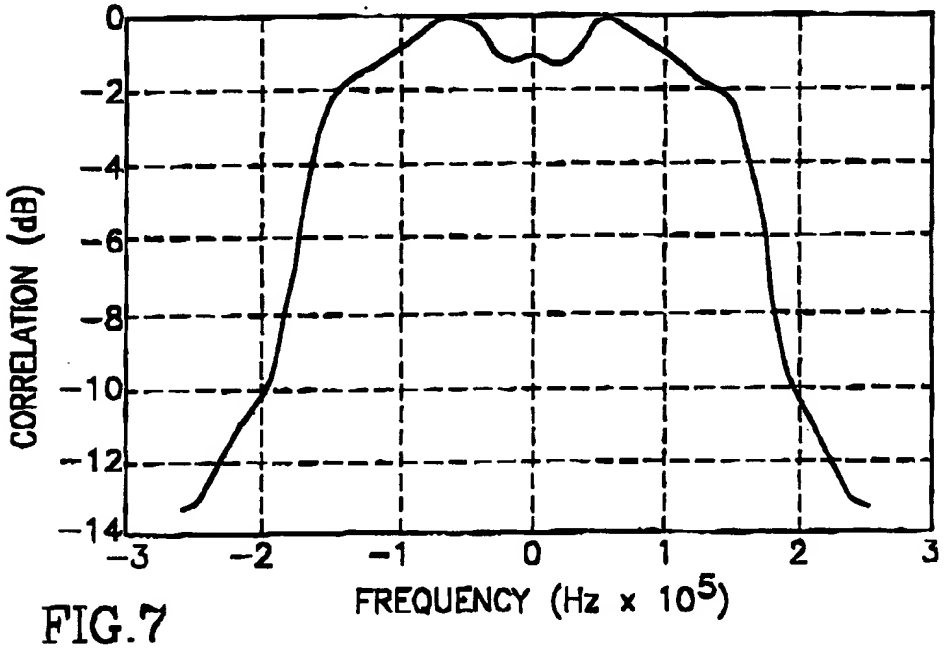
0
-2
-4
-6
-8
-10
-12
-14
CORRELATION (dB)
-3
-2
-1
0
1
2
3
FREQUENCY (Hz x 10^5)

FIG.7

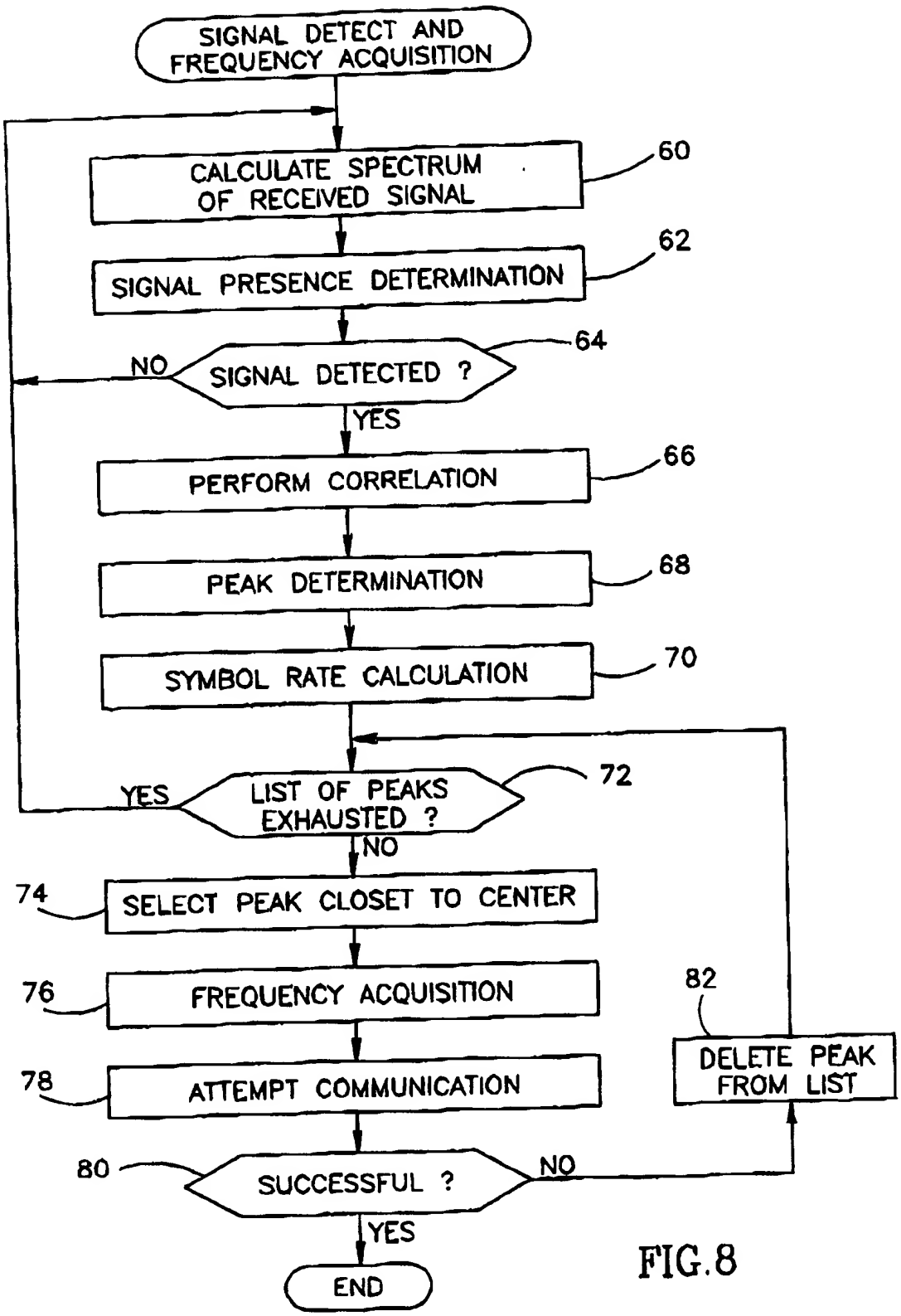
SIGNAL DETECT AND FREQUENCY ACQUISITION
CALCULATE SPECTRUM OF RECEIVED SIGNAL
60
SIGNAL PRESENCE DETERMINATION
62
NO
SIGNAL DETECTED ?
64
YES
PERFORM CORRELATION
66
PEAK DETERMINATION
68
SYMBOL RATE CALCULATION
70
YES
LIST OF PEAKS EXHAUSTED ?
72
NO
74
SELECT PEAK CLOSET TO CENTER
76
FREQUENCY ACQUISITION
78
ATTEMPT COMMUNICATION
80
SUCCESSFUL ?
NO
YES
END
82
DELETE PEAK FROM LIST

FIG.8

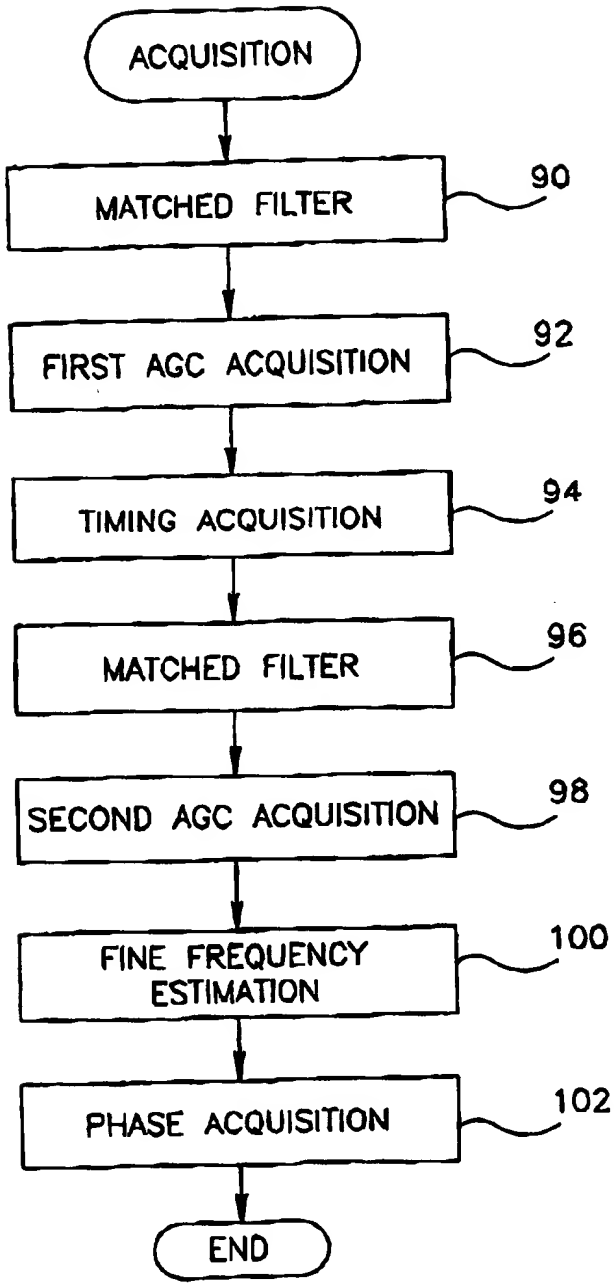
ACQUISITION
MATCHED FILTER
90
FIRST AGC ACQUISITION
92
TIMING ACQUISITION
94
MATCHED FILTER
96
SECOND AGC ACQUISITION
98
FINE FREQUENCY ESTIMATION
100
PHASE ACQUISITION
102
END

FIG.9

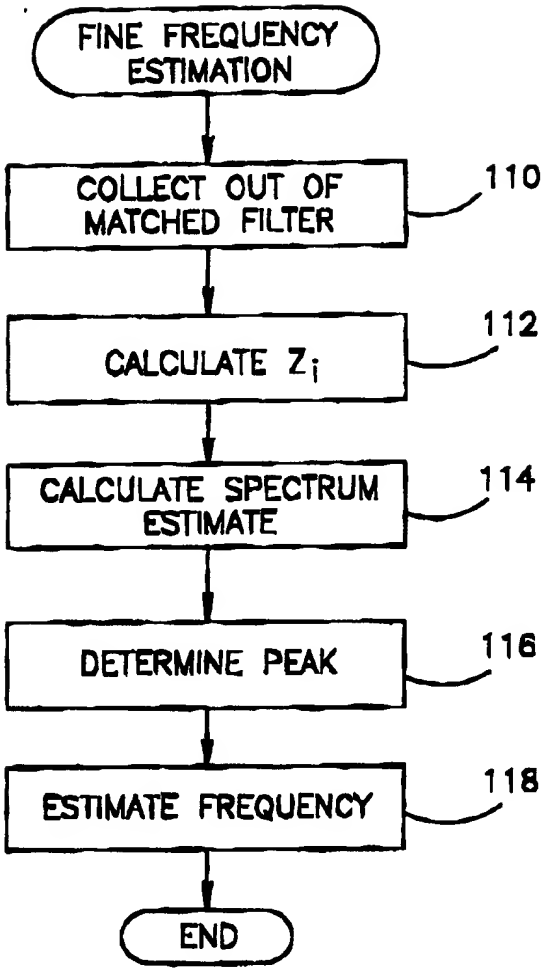
FINE FREQUENCY ESTIMATION
COLLECT OUT OF MATCHED FILTER
110
CALCULATE Z_i
112
CALCULATE SPECTRUM ESTIMATE
114
DETERMINE PEAK
116
ESTIMATE FREQUENCY
118
END

FIG.10

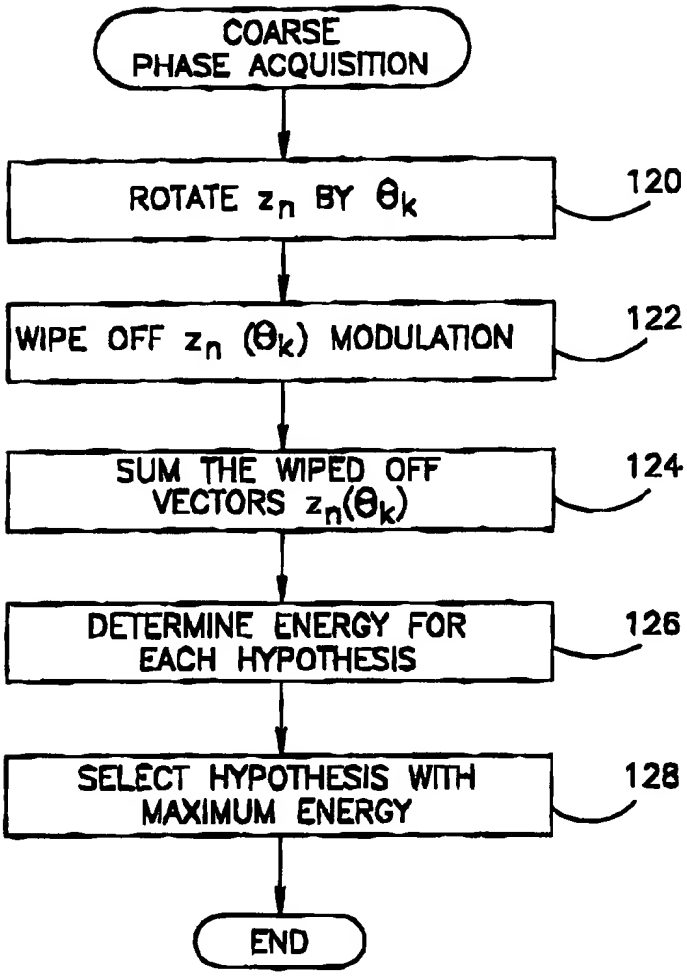

FIG.11

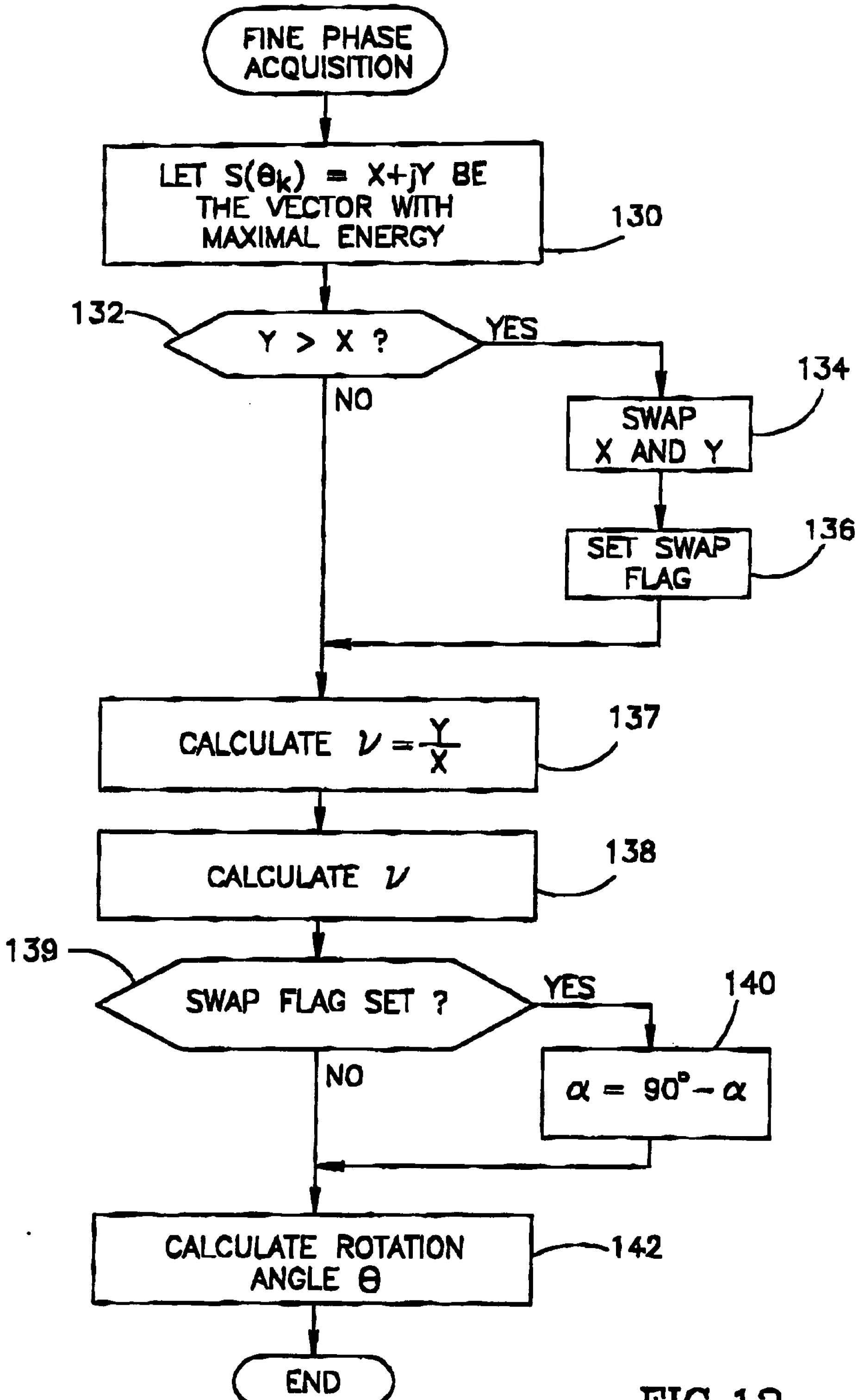

FIG.12

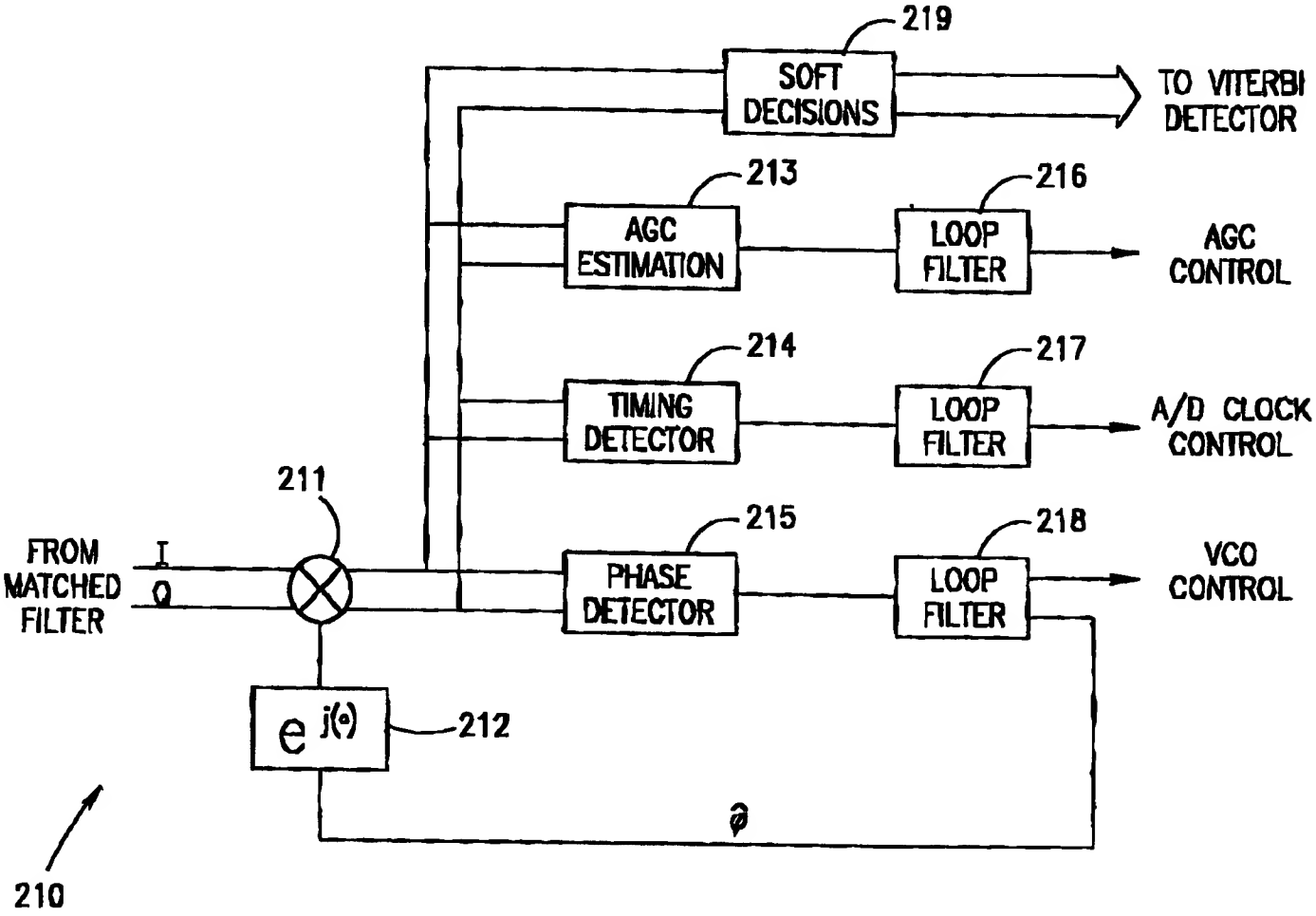

FIG.13

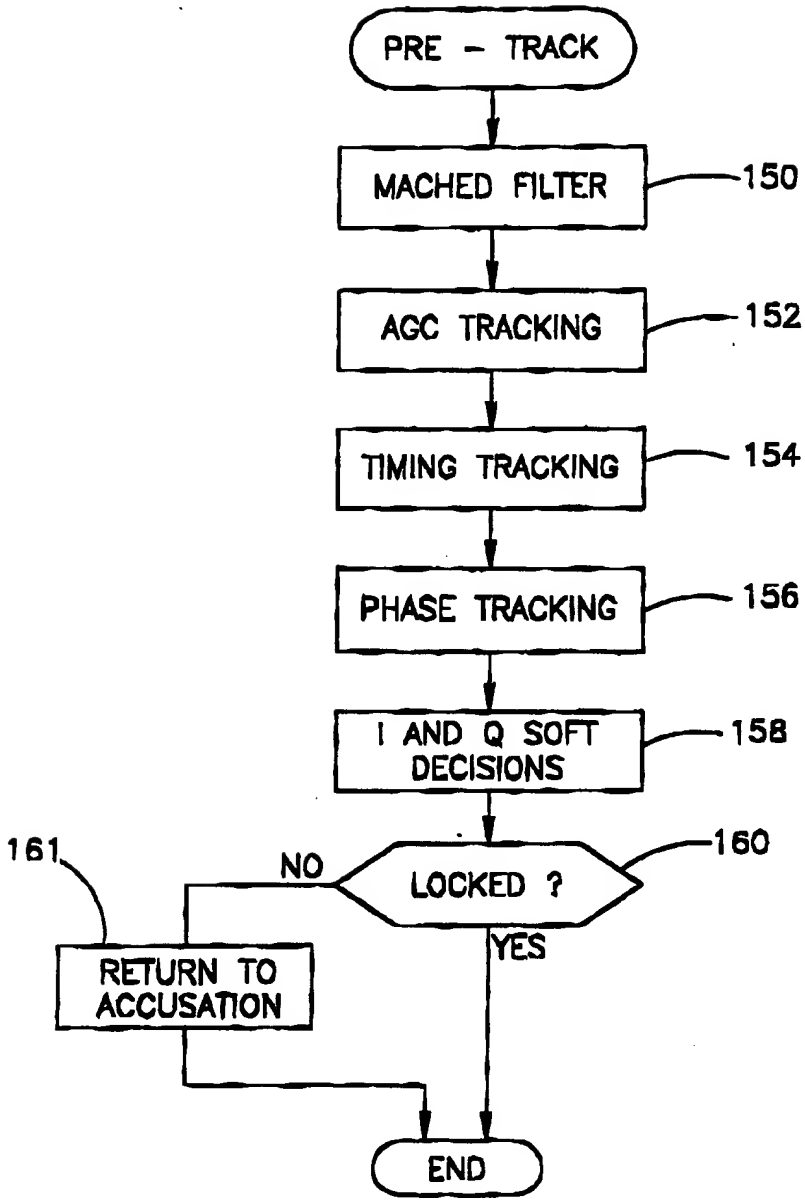
PRE - TRACK
MACHED FILTER
150
AGC TRACKING
152
TIMING TRACKING
154
PHASE TRACKING
156
I AND Q SOFT DECISIONS
158
LOCKED ?
160
NO
YES
161
RETURN TO ACCUSATION
END

FIG.14

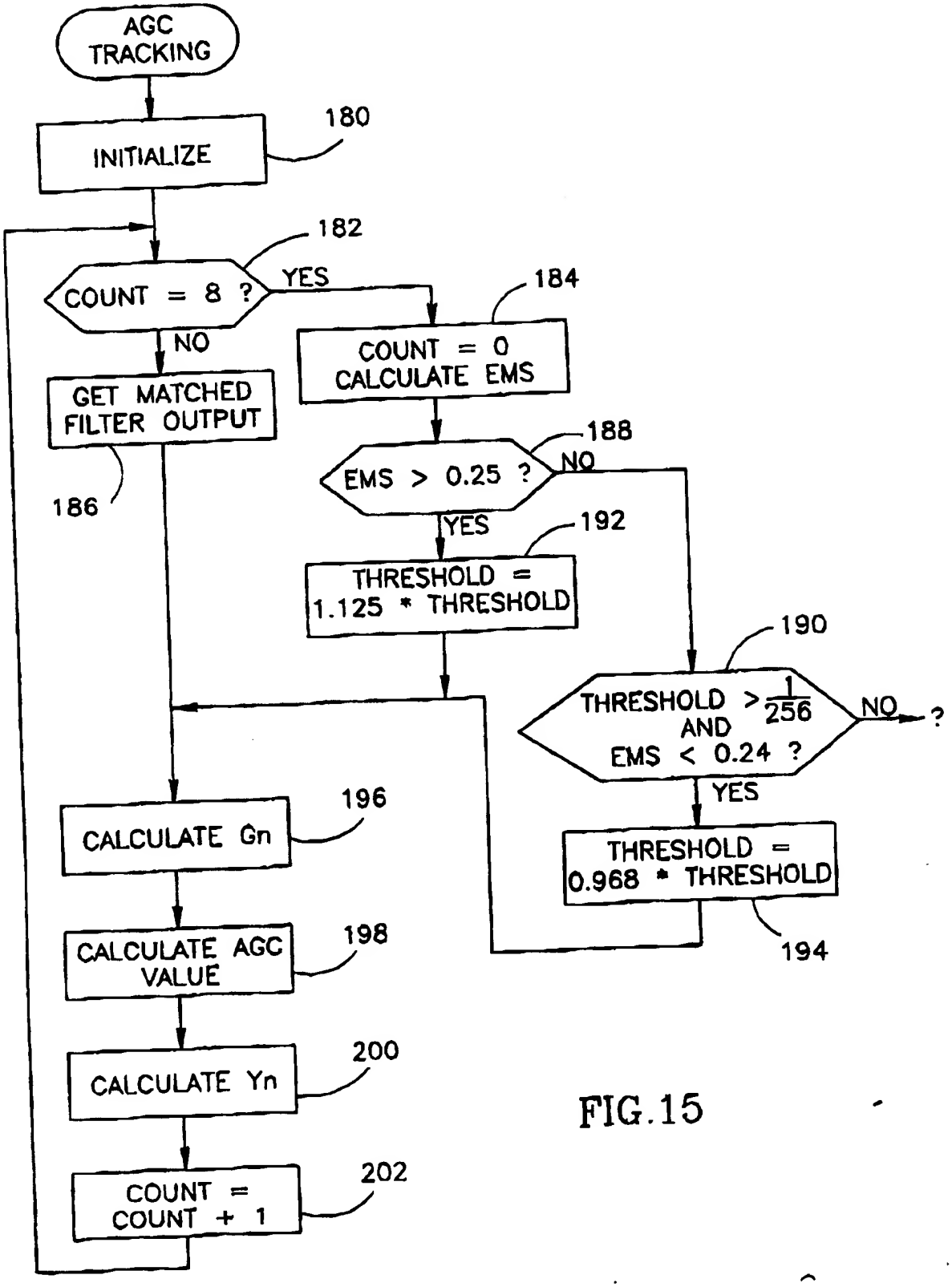
AGC TRACKING
INITIALIZE
180
182
COUNT = 8 ?
YES
NO
184
COUNT = 0
CALCULATE EMS
GET MATCHED FILTER OUTPUT
186
188
EMS > 0.25 ?
NO
YES
192
THRESHOLD = 1.125 * THRESHOLD
190
THRESHOLD > 1/256 AND EMS < 0.24 ?
NO
YES
THRESHOLD = 0.968 * THRESHOLD
194
196
CALCULATE Gn
198
CALCULATE AGC VALUE
200
CALCULATE Yn
202
COUNT = COUNT + 1

FIG.15

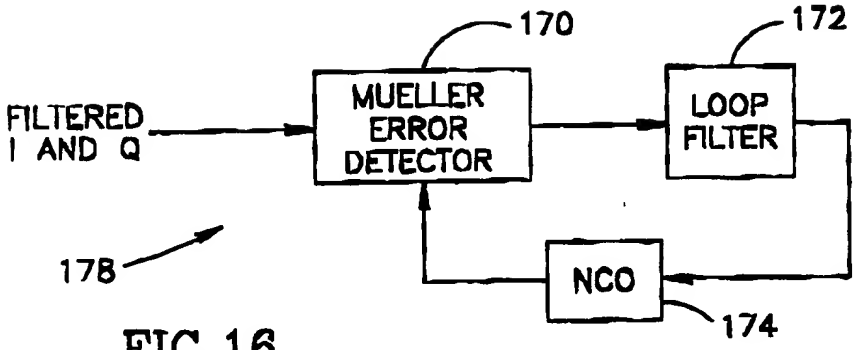
170
172
FILTERED
I AND Q
MUELLER
ERROR
DETECTOR
LOOP
FILTER
178
NCO
174

FIG.16

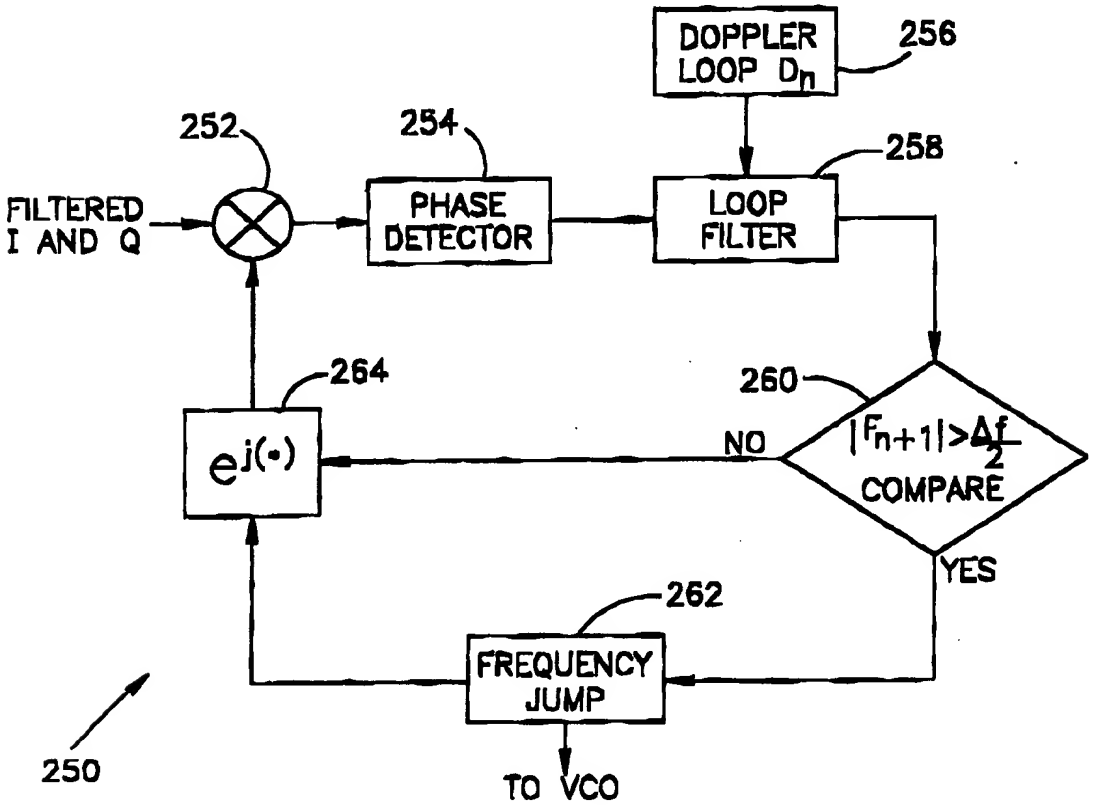
DOPPLER
LOOP D_n
256
252
254
258
FILTERED
I AND Q
PHASE
DETECTOR
LOOP
FILTER
264
260
$e^{j(\cdot)}$
NO
$|F_{n+1}|>\frac{\Delta f}{2}$
COMPARE
YES
262
FREQUENCY
JUMP
250
TO VCO

FIG.17

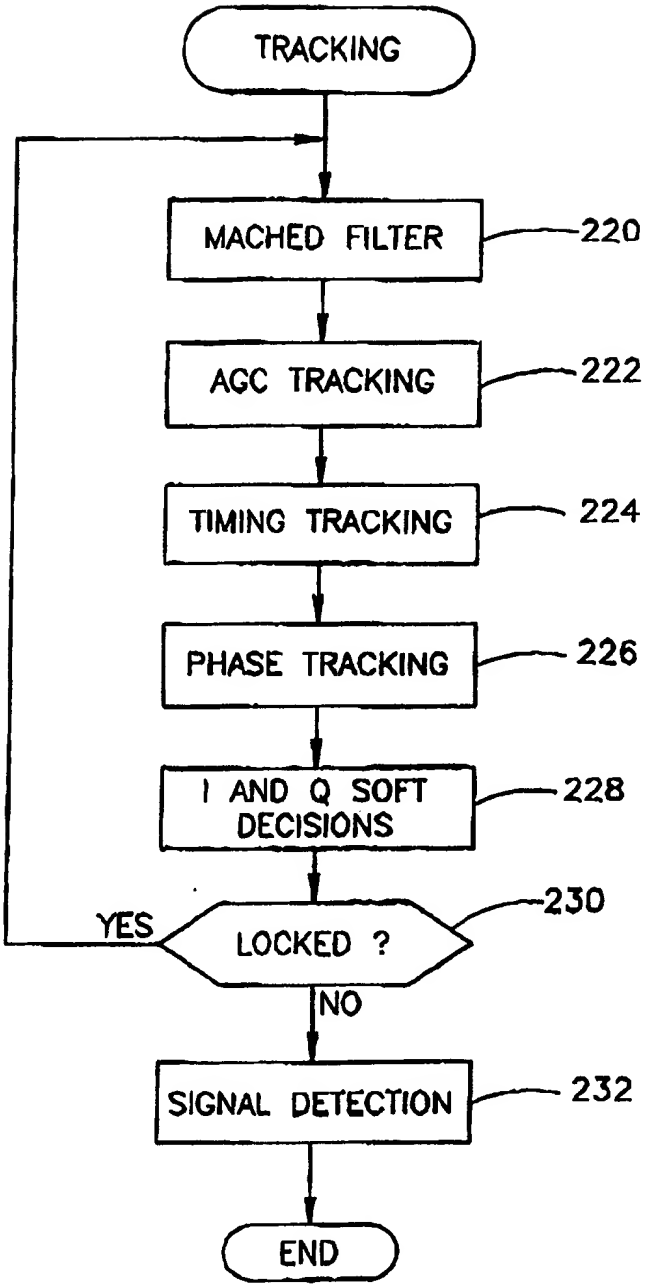
TRACKING
MACHED FILTER
220
AGC TRACKING
222
TIMING TRACKING
224
PHASE TRACKING
226
I AND Q SOFT DECISIONS
228
YES
LOCKED ?
230
NO
SIGNAL DETECTION
232
END

FIG.18